

## Letter to the Editor<sup>†</sup>

### Misleading Terminology Regarding the Possible Induction of Apoptosis by Laser

It was with great interest that I read Dr. Jiri T. Beranek's thoughts [1] about the possible induction of apoptosis by "low-power" laser-induced interstitial thermotherapy, being based on previous findings [2] and results from Dr. Chapman [3]. As a dermatologist trained in photomedicine with some experience in the field of low-intensity laser medicine and apoptosis [4–7], I feel that some comments on the photobiologic terminology are appropriate.

Although the exact dosimetric data (dose, intensity) were not given, the tissue effects described in both papers [1,3], i.e., presence of char, protein denaturation, and induction of coagulation, clearly show that high intensities of light had been administered to induce thermal effects (which is in contradiction to the definition of "low-power" or "low-level" laser therapy being an athermic therapeutic modality). The criteria for the observed induction of apoptosis also seem rather unspecific ("giant cells" are most likely phagocytes, which are not necessarily associated with apoptosis) and in my opinion need more detailed evaluation (e.g., immunohistochemistry, flow cytometry, etc.). The phenomenon of tissue repair without the occurrence of scarring after laser exposure could be explained by the hypothesis of Oshiro who proposed that during the application of "high-power lasers" an apple-shaped surrounding tissue area is exposed to low doses of light that may be responsible for simultaneous "biostimulatory" effects [8], which in turn may induce collagen production and other repair mechanisms.

Moreover, we recently evaluated the possible influence of low-intensity 670-nm laser irradiation on cell death in epidermal cells and could

clearly demonstrate that this form of phototherapy does induce neither apoptosis nor necrosis (unpublished observation).

In conclusion, I recommend that the terminology regarding any laser application should be based on established photobiologic terms of dosimetry.

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<sup>†</sup>This is a reply to Dr. Beranek's Letter to the Editor, which was published in *LSM* 23:65 (1998).